

# A Record and Reporting System for Field Research Units

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A UNIFORM system of records, files, and reporting has been devised to facilitate collection by several field research units of data suitable for consolidation. Its use permits efficient daily operation with the flexibility necessary to serve individual goals of each unit, yet makes practical the reporting of comparable data to a central office for reduction and processing.

The research, under the sponsorship of the Field Investigations and Demonstrations Branch of the National Cancer Institute, Public Health Service, deals with the cytology and epidemiology of human uterine cancer. Each of 10 field units aimed to examine initially around 50,000 to 75,000 or more women, recalling as many as possible for second and third examinations at yearly intervals. The total number examined by all the units is estimated to be of sufficient magnitude to provide statistically valid casefinding, prevalence, and incidence rates for invasive cancer and carcinoma in situ by age group.

In 3 years' operation the record and reporting system has proved effective and workable. A similar plan should be generally usable in medical and public health activities collecting uniform data from geographically separated field stations.

The field research projects obtain cytological specimens, identifying data, and selected medical history information from women recruited

from various segments of the population. The specimens are examined in the unit's cytology laboratory. The cytodiagnosis is entered on an individual patient record form for statistical analysis and is also reported to the examinee or her personal physician. Any necessary additional cytological, histodiagnostic, or clinical studies are performed by or at the request of the personal physician, and results of these are also entered on the examinee's record. Since the several units use similar cytological methods, the data can be collated and totaled.

## Record Forms

Three principal records were designed for the study: a basic medical record card, an alphabetical index, and a recall card. The basic record card has undergone one redesign and revision to take care of practical problems encountered in operation.

The patient medical record is an 8-inch by 10-inch card with fairly generous space for each entry (fig. 1). Its format is intended to facilitate reduction of the data to punchcards. To simplify coding, most of the history items are multiple-choice questions that can be answered by a checkmark or a single word or number. Very little writing need be done to record the complete personal and medical history called for. Results of cytology slide readings and tissue diagnoses are described verbally in designated spaces, but they are also recorded by code numbers. Use of the diagnostic codes simplifies uniform reduction of data for all projects and obviates the interpretation of handwriting and medical terms by coding clerks. Space is provided for results of repeat tests as necessary.

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Figure 1. Patient record card

1. CASE NO.		2A. DATE		2B. DATES OF PREVIOUS SCREENINGS								
IDENTIFICATION	3. NAME <small>(Last)</small>			<small>(First)</small>			<small>(Middle)</small>		4. PHONE	5. TYPE SMEAR		
	6. ADDRESS <small>(Number and street)</small>			<small>(City)</small>			<small>(State)</small>		7. RESIDENCE- CODE _____ <input type="checkbox"/> NON-RES.			
HISTORY	8. RACE <input type="checkbox"/> WHITE <input type="checkbox"/> NEGRO		9. AGE	10. RELIGION <input type="checkbox"/> PROT. <input type="checkbox"/> CATH. <input type="checkbox"/> JEW.		11. MARITAL STATUS <input type="checkbox"/> MARRIED <input type="checkbox"/> WIDOW <input type="checkbox"/> SINGLE <input type="checkbox"/> SEP. OR DIV.		12. AGE AT FIRST MARRIAGE	13. AGE AT FIRST PREGNANCY	14. AGE AT LAST PREGNANCY	15. NOW PREGNANT <input type="checkbox"/> NO <input type="checkbox"/> YES	
	16. NUMBER OF PREGNANCIES TOTAL _____ STILL B. _____ LIVE BIRTHS _____ MISCARR. _____ ABORTIONS _____			17. AGE AT MENARCHE	18. DATE OF LAST MENSTRUATION MO. _____ YR. _____		19. MENSTRUAL REGULARITY <input type="checkbox"/> REG. <input type="checkbox"/> IRREG.		20. YEARS SINCE MENOPAUSE BEGAN		21. UTERINE CANCER STATUS <input type="checkbox"/> NOT SUSPECTED <input type="checkbox"/> ALREADY DIAGNOSED <input type="checkbox"/> SUSPECTED. REASON:	
	22. ABNORMAL VAGINAL BLEEDING, BLOODY DISCHARGE OR SPOTTING WITHIN PAST YEAR, DURATION _____ <input type="checkbox"/> NONE PRIOR TO PAST YEAR, DURATION _____						23. PREVIOUS UTERINE OR PELVIC TREATMENT <input type="checkbox"/> NONE <input type="checkbox"/> HORMONES <input type="checkbox"/> RADIATION <input type="checkbox"/> SURGERY DESCRIPTION AND DATES:					
	24. PRIVATE PHYSICIAN				25. PHYSICIAN'S ADDRESS				26. LAST PELVIC EXAMINATION DATE _____ BY WHOM _____			
	27. SOURCE <input type="checkbox"/> PRIVATE PHYSICIAN <input type="checkbox"/> INDUSTRY <input type="checkbox"/> CYTOLOGY UNIT CLINIC <input type="checkbox"/> INSTITUTION <input type="checkbox"/> OTHER						28. CLINIC		29. WARD			
REMARKS												
LABORATORY RESULTS												
TYPE	NUMBER	SOURCE	READING	DATE	REPORT TO <input type="checkbox"/> DR. PAT.	DATE SENT	RECOM.	SCREENERS' NOTES				
1.					<input type="checkbox"/> DR. PAT.							
2.					<input type="checkbox"/> DR. PAT.							
3.					<input type="checkbox"/> DR. PAT.							
4.					<input type="checkbox"/> DR. PAT.							
5.					<input type="checkbox"/> DR. PAT.							
TYPE SPEC.		DATE	DIAGNOSIS									
LAB.		NO.	CODE									
TYPE SPEC.		DATE	DIAGNOSIS									
LAB.		NO.	CODE									
INDUSTRIAL OR INSTITUTIONAL PHYSICIAN				PATIENT'S OCCUPATION				FIRM BY WHOM EMPLOYED				
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE PUBLIC HEALTH SERVICE				* U. S. GOVERNMENT PRINTING OFFICE : 1957 O-7-42931				PHS-1819-9 (Rev. 4-57) VAGINAL CYTOLOGY EXAMINATION				

The classification of cytology results and final diagnoses based on tissue studies or other procedures was agreed upon by all project directors. To accommodate minor variations in the scheme, two-digit codes were devised. All directors agreed, however, to observe the dividing lines between the five major categories of results as uniformly as possible.

Both sides of the card are identical so that two series of tests may be recorded. Some projects, however, find it more practical to use a fresh card for each series. When used in the immediate environs of a project, this record is printed on a fairly heavy index stock, but when it must be folded or rolled for mailing, it is printed on a lighter stock.

The patient record is initiated by the physician, nurse, or technician who collects the speci-

men and enters and checks the identification and medical history items. Detailed instructions for completing the card were issued to the staff of all projects. The field unit's central office assigns case numbers for identification and as an automatic count of the number of women examined. An examinee retains the same case number throughout her participation in the project, and each number is used only once. If a number is vacated because of duplication, it is reassigned to a new patient. The field unit keeps a register of its case numbers, showing the numbers in serial order and the names of the examinees.

Patient record cards are filed by case number. This system has the major advantage of expandability by addition at the end. In an alphabetical file, when expansion becomes necessary,

nearly all cards in the file must be shifted. Also, numbers can be sorted and filed much more quickly and accurately than names.

For filing these 8-inch by 10-inch cards, cases are available with shallower drawers than are used in regular letter files. Thus, a case of standard height accommodates five drawers instead of four, which greatly reduces the space required for filing cabinets.

In order to attain the individual project goals, repeat examinations are necessary at stated intervals, usually yearly, on as many examinees as possible. A recall file has been set up to assist in this function. It operates as a tickler file to indicate which examinees are to be recalled each month. The recall card, 3 by 5 inches in size, contains name and case number of patient, home address and telephone, business address (if any), husband's name, and name and address of a friend or relative who presumably will always be in touch with her, plus screening and recall dates (fig. 2). Experience has shown that contact and recall is facilitated greatly by the supplementary information on this card. Quantitative evaluation of the usefulness of the various items in contacting examinees has not been attempted, but each item has been useful in locating some examinees.

Recall cards are filed according to month of

examination. A set of index guides for the months of the year is required, along with 12 sets of alphabetical guides, so that names may be alphabetized within each month. All cards filed under a given month are then ready to be lifted out and used for recall 1 year later. If a smear or other specimen is received for a patient before her recall date, her recall card is moved to the current month so that she will not be recalled until a year after the most recent examination.

The recall file is intended only for annual or other routine recalls. The medical record cards for examinees requiring repeat of unsatisfactory or suspicious tests or tissue studies are kept in a temporary file which can be accommodated easily without special provisions. The cards in this file for examinees who do not respond within a reasonable time (60 to 90 days) and who cannot be located by the followup staff are removed and placed in the main record files as incomplete cases. This procedure avoids obstructing the very active temporary file with cards that may never be reactivated.

Since the patient record cards are filed numerically, an alphabetical index is kept to enable the staff to find records by name of the examinee. The alphabetical index is made up on panels mounted on a rotary stand (fig. 3).

**Figure 2. Recall card**

MRS./MISS		NO.	
ADDRESS—HOME		PHONE	
REMARKS:			
ADDRESS—BUSINESS		PHONE	
HUSBANDS NAME		MAIDEN NAME	
RELATIVE OR FRIEND			
ADDRESS			
SOURCE PHYS - HOSP - ETC.			
DATES SCREENED			
DATES RECALLED			
PHS-1819-11			
3-56		RECALL RECORD	

Each panel accommodates a large number of narrow strips of composition board on which are typed names, addresses, case numbers, and any other identifying information desired.

As the cytological specimen and the medical record card are received at the project records office and before a case number is assigned, each name is checked against the alphabetical index to determine whether or not the individual is a new participant. If an examinee has been seen previously, the existing card is pulled from the file and the new results added. The record cards for new patients are alphabetized and index strips are typed from the cards so that the strips are automatically in proper order for adding to the panels.

The alphabetical index may be started with a small capacity and later expanded. However, starting with the full expected capacity reduces the need for shifting panels and strips as the index expands. In our system, all project directors elected to start with the full capacity. Subdivisions separating an alphabetical file of names into any given number of approximately equal groups are available from filing equipment manufacturers. These are important, since the filling of panels at unequal rates will necessitate the shifting of large numbers of strips from panel to panel to make room. Alphabetical guides for labeling the panels may be purchased or prepared to correspond to such subdivisions.

In addition to these basic records, each project has established one or more subsidiary files for special purposes. These files usually consist of duplicates or abstracts of a portion of the main medical record file to keep closer track of "all positive cases" or "all suspicious cases," for example.

### Reporting System

Several methods of reporting the data to the central office were considered. Accuracy and simplicity were of course basic requirements, but also it was considered essential to obtain copies of records with minimum disturbance of recordkeeping routines at the field units. Although a number of methods might have met these objectives, it was decided to transmit copies of the records by microfilm. Microfilm-

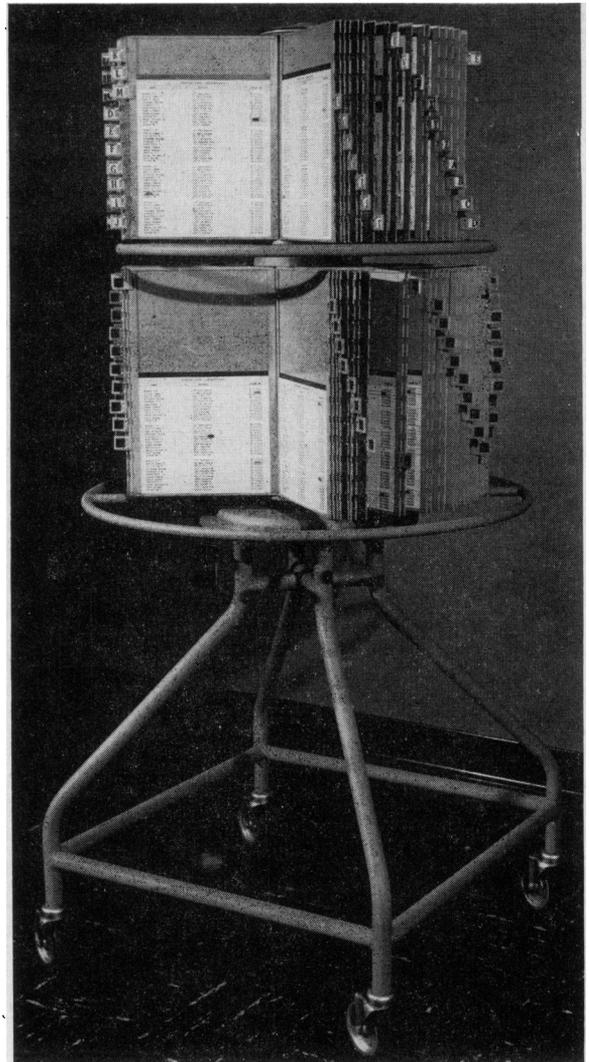


Figure 3. Alphabetical index

ing is a simple procedure, and it provides a batch of records that is a compact and inseparable unit rather than 1,800 separate prints.

A microfilmer for photographing records on 16-mm. film (at a reduction of 19 to 1) was placed in use in each project. The equipment is rented, and instruction and service as well as installation are included in the rental charge. Thus the personnel of the field unit have a minimum of responsibility for taking care of the machines.

A procedure was set up for filming each record as soon as it is completed and before it is permanently filed. After a record is filmed, the last entry is checkmarked. This notation

enables the central office coding clerks to tell which results are new if the same record is refilmed later to show more information. When an additional examination is entered on the same form, the record is refilmed to show the new information and the last line of results is again checkmarked. When an annual reexamination is made, the entire case record is filmed, in reverse chronological order, so that the coding clerks can evaluate the patient's entire record.

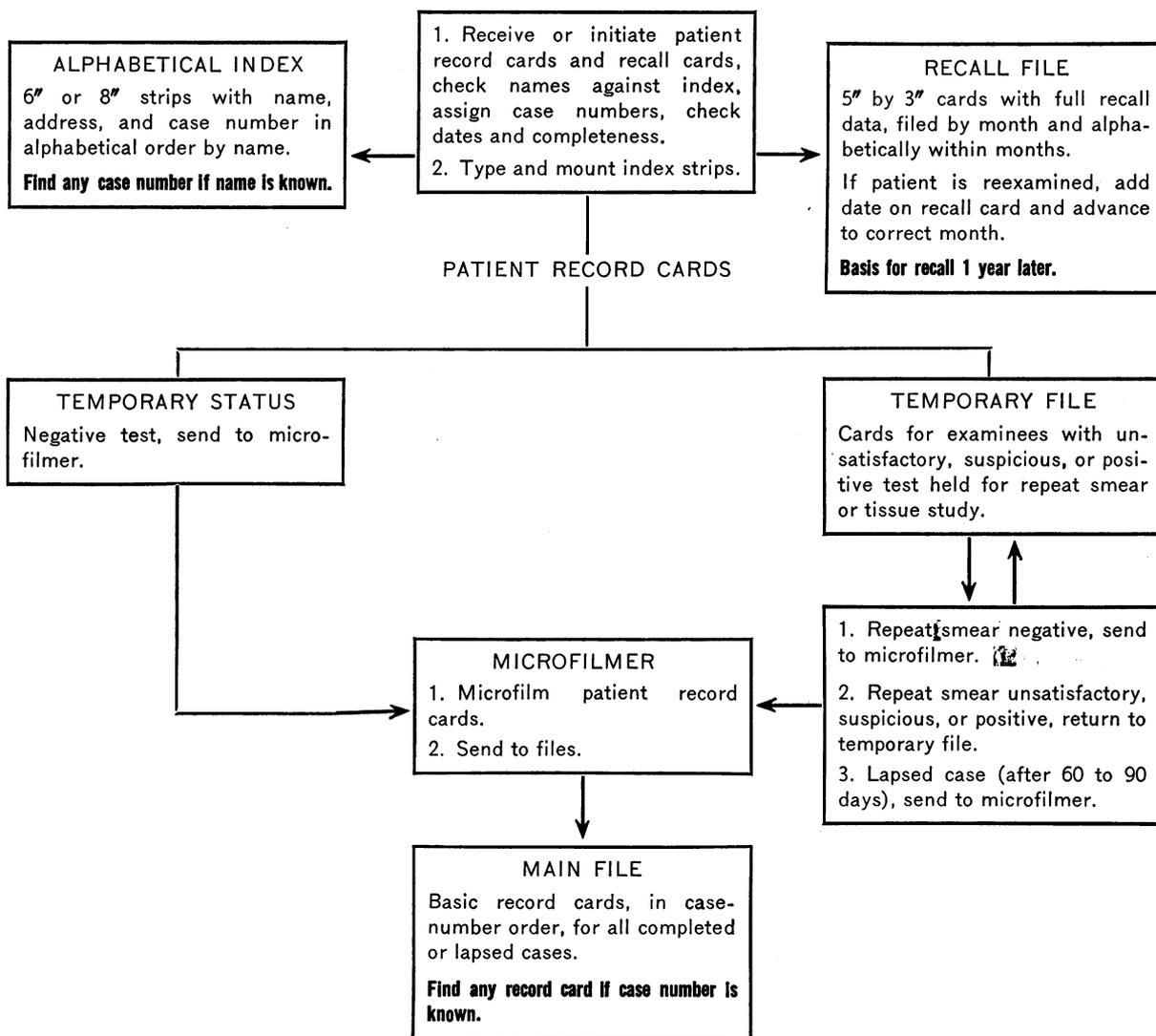
Since there is occasionally a faulty film, the field unit keeps a record of case numbers included on each reel or flags the group of cards

in the file until informed by the central office that the film has been received and is satisfactory.

The microfilm reels are mailed in preaddressed envelopes to the vendor in Washington, D.C., where they are developed and forwarded to the central office of the study. When a reel is received, the central office routinely mails a fresh reel of film to the field unit.

The microfilm method of transmitting records is highly satisfactory. It provides the central office with a current account of the number of examinees and the correctness of record-keeping. It makes possible the current or nearly

### Flow Chart for Cytology Project Records



current reduction of all data to punchcards. It encourages accurate and legible records, since everyone concerned knows that the records must be capable of photographic reproduction. The method is economical for large numbers of records, and no copying errors can occur. Project files are not disturbed, since record cards are microfilmed before they are filed.

### Central Office Operations

Centralization of coding operations has proved its worth. It permits control by the central office of the code used, the interpretation of coding rules, special decisions, and the like. The central office, having in mind the objectives of the entire study, can apply the same rules and procedures to all data.

For economy and speed, coding is done and cards are punched directly from the microfilm images. This procedure is used by the National Office of Vital Statistics, Public Health Service, for the large volume of documents it receives on microfilm. It has proved practical and economical, since the touching of a key is quicker and less laborious than writing a code digit. The coding clerk, after a few weeks' training, becomes thoroughly familiar with the code and quite adept at the job, coding and punching from 75 to 100 cards per hour. During the training period and early experience of a coder, all cards are verified by an experienced operator. Thereafter, only non-negative cases and 10 per cent of the negatives are verified.

All non-negative cases are verified because, since they are a small percentage of all cases, any errors would have a great effect on results. A few errors in the negative cases, on the other hand, could have only a minor effect on the analysis. Furthermore, essential items on negative cards can be checked in batches by needle or sight, since certain punches must be the same in all cards.

Direct coding and punching has proved particularly useful in handling the unexpectedly large volume of repeat examinations. Copying or the use of carbon paper would have meant a tremendous amount of additional clerical work, with greater opportunity for errors and misunderstandings. With the system in use, a re-

peat examination calls merely for an additional filming of the card or cards, and an up-to-date punchcard can be produced quickly from the film. Duplicate cards are detected by mechanical matching of case numbers, and the up-to-date card is selected to be retained in the file.

The punchcards contain 45 columns of data which are uniform for all field units. Those units using different types of specimens and those collecting special data are assigned additional columns. Six columns are used for check or control punches beyond the actual data recorded. Four types of cytological smear are used by the 10 units, but the results of a given type of specimen are always punched in the same columns. For rapid routine tabulations, the cytology results are summarized in one column. The code for repeat examinations is shorter than for original examinations, since most of the medical history is already on record and need not be repunched. Items of data for successive examinations are always punched in the same columns to achieve uniformity in sorting and tabulating and in summarizing the cards for an examinee.

### Summary

A system of uniform records and files is now in operation in a large research study of human uterine cancer. Designed for collection by a number of separated field stations of data that can be consolidated, it should be adaptable to the needs of other medical or public health projects with similar objectives.

The record system is coordinated with transmittal of data by microfilm to a central office. There the data are coded from the microfilm images and punched directly into cards. Centralization of coding has the advantage of uniformity, and prompt transmittal and punching of data give the further advantages of providing information on status of work and quality of records, making immediately available simple tabulations for administrative purposes and facilitating currency of punchcard data for preliminary or final analysis.

*Copies of the instructions for filling out the basic record card, numbering of cases, and microfilming the basic record may be obtained from Mr. Carroll.*